POSITIONAL ISOMERISM IN THE FATTY ACIDS OF TRIGLYCERIDES OF AUSTRALIAN FISH - PREDOMINANCE OF n-3 FATTY ACIDS IN THE sn-2 POSITION

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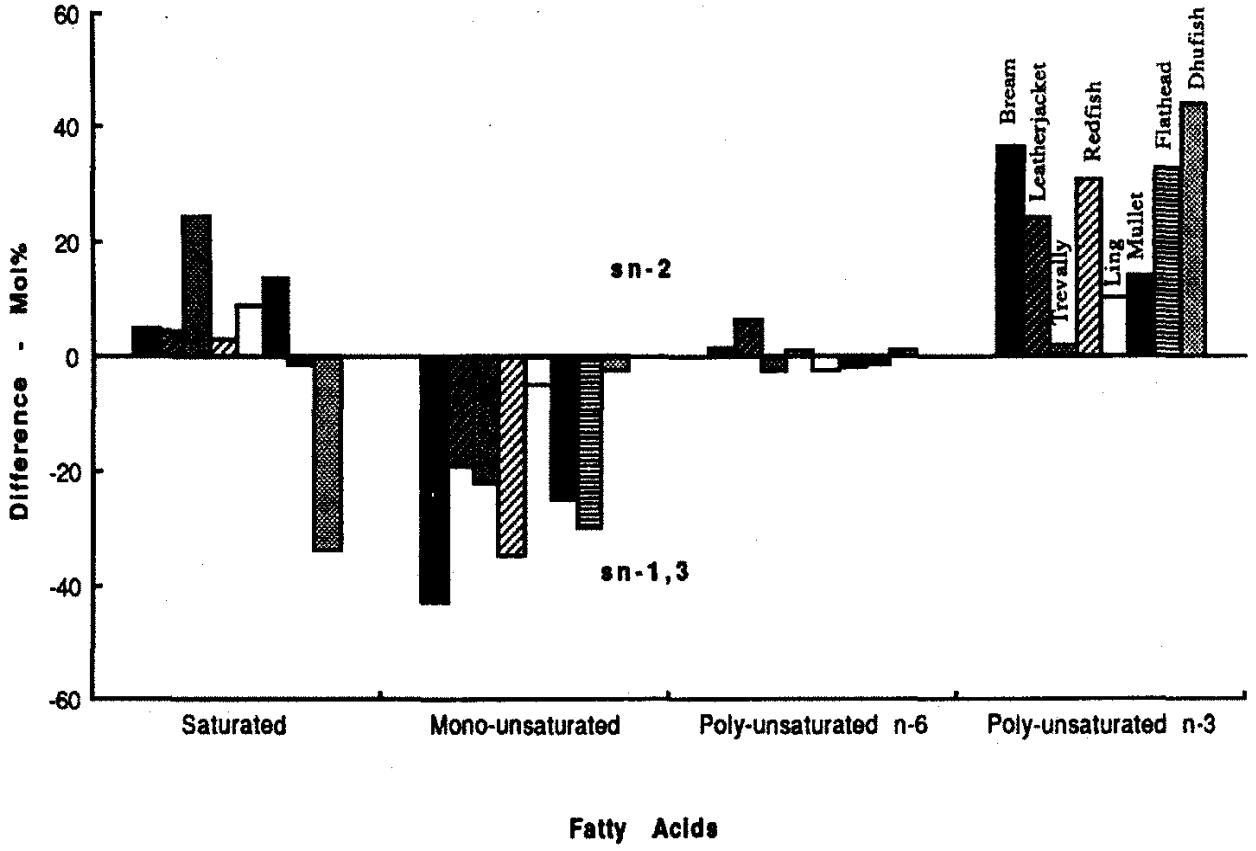
The positional distribution of fatty acids in dietary lipids (sn-2 vs sn1,3 positions) is important in determining their metabolic fate. A survey (funded by ARC) has begun of Australian fish to determine the relative abundance of the metabolically active n-3 fatty acids (eicosapentenoic and docosahexenoic) in the sn-2 position of fish fats. The fat from eight species of NSW coastal fish was extracted. After an initial Grignard reaction to isolate (by TLC) the sn-1,2/2,3 diacylglycerols, a phosphorylation step and subsequent treatment with phospholipase A_2, fatty acids from the sn-2 position were isolated, transmethylated, identified and quantified by GLC.

Most of the mono-unsaturates appeared in the sn-1,3 position, one major exception being Dhufish, with large amounts of eicosenoic acid (C20:1 n-11) in the sn-2 position (Figure). Ling showed a fairly even distribution of oleic acid (C18:1 n-9), whereas all other species showed this fatty acid predominantly in the sn-1,3 positions. The n-6 PUFAs were present in only small proportions and were evenly distributed throughout, one notable exception being Leatherjacket where arachidonic acid (C20:4 n-6) was predominantly in the sn-2 position.



The major features to emerge from this small survey were the dominance of n-3 PUFAs in the sn-2 position and mono-unsaturates in the sn-1,3 position.

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